

available how many years in advance depends on the expected life of the property, the accuracy with which the date of retirement can be guessed and the basis on which the prepayment is accrued, but a greater or smaller number of dollars will almost always be unavoidably waiting around for their turn to be reused and under most circumstances some temporary use of such assets can advantageously be made. 4

The progressive accrual of partial payments on the cost [14683] of assets assumed to be subject to eventual retirement also serves the purpose of spreading the cost which matures at retirement over all the consumers served during the period of useful life.

This useful consequence is not very important in fact as far as smaller units of shorter lives are concerned since these by their frequency and distribution tend naturally to spread themselves over time. It is also admitted that this function is not particularly important after a composite property has aged to the state of equilibrium when annual accruals and annual retirements tend to balance if not yearly then at least over relatively short terms of years.

The cost-spreading function of an accrual of advance payments against the cost at retirement is therefore primarily limited to the period in the life of an enterprise during which it is outgrowing an abnormal and temporary degree of newness.

Paradoxically however, it is this very accrual of the difference between the cost of newness and the most economical degree of newness found to obtain after a composite property reaches maturity equilibrium, which proves most functionless and unnecessary since it will under the assumption of a continuing enterprise never be called on to meet the cost of retirements.

Provision of reserves for this well understood phenomena of "theoretical accrued depreciation" is thus amortization of [14684] the investment and not an advance necessary to meet cost at retirement. Since the amortiza-

tion of the cost of newness in excess of the most economical level of composite newness serves little practical purpose, when carried beyond the point of a reserve of such proportions as might improve the credit of the enterprise, its amortization should if at all be pursued at a most reasonable and temperate rate.

The rapid and arbitrary extinguishment of the "cost of newness" beyond the level which results in enterprise credit improvement, serves no useful economic purpose and constitutes in fact under some regulatory treatment but a compulsory displacement of the investor by the customer, a compulsory substitution of customer advances for the funds provided by the investors.

Whether the reserves accrued to meet that part of the cost of 100 per cent newness which will never be used to meet cost upon retirement serve any other economic purpose for the enterprise depends on how they can be employed, how much they cost the enterprise, how much of a penalty is under regulation attached to their collection, retention or employment.

Q. In what way does the utility enterprise pay for having collected, retained and/or employed the consumer advances against the time of retirement? A. Both the manner in which the enterprise pays and how much it pays depends on the regulatory formula employed. There are several obvious ways and the amount of the payment can [14685] by various devices be adjusted to work out fairly and economically for investor and consumer.

Under one method the enterprise can charge itself an interest deduction from income and credit that amount to the depreciation reserve. This is the simplest and easiest way by which both consumer and investor equities can be recognized, reconciled and administered. This method does not require attempted prophecy as to economic life of the property with a precision beyond human ability to forecast, neither does it require the pretense of identity between reserve-balance and depreciation of the property in fact.

The amount of the accrual can be varied without affectation of capacity for prophetic precision and the rate which the enterprise pays can be changed as circumstances dictate. By such a simple and unaffected method the consumer is automatically credited in the proportion to which his payments against cost at retirement prove to be advances.

With management naturally on guard not to be caught with too little and commissions in position to prevent the accrual of too much too soon the investor and consumer are protected against excess in either direction and each paid for the economic functions which they perform at a price fairly representative of what their function is worth.

The sinking fund method is also available and operates equitably when an interest rate is used which on the one [14686] hand operates to accrue an adequately protective reserve and on the other does not employ an interest factor in excess of the rate of interest which the enterprise can earn without assuming additional risks, hazards and uncertainties for which it is not otherwise compensated.

Q. How does the enterprise pay for the consumer advances under the straight-line method? A. The investor pays directly by never receiving or being allowed to receive a return on so much of his investment in rate base property as is equal to the amount of the reserve balance.

The deduction of reserve balances from the nominal dollar investment amounts to the same thing as charging the enterprise the full rate of return for such use as it may be able to make of the consumer's advance deposits.

Q. Is the consumer economically entitled to compensation for his advance payment? A. Yes, the principles of economics clearly establish that assets and the means of acquiring assets have a time value because human beings have a preference for the present over the future, for a present gratification over a future gratification.

Depreciation reserve balances reflect the extent to which consumers have under regulation prepaid. They are entitled in equity and by all the principles of economic

science to a fair price for the economic sacrifice they make and the [14687] service their sacrifice renders.

Q. What is the economic function which the consumer performs by advancing payment for the cost of assets at the time of retirement and for which the consumer is entitled to compensation? A. He is entitled to compensation for the time or interest value of his advance and in my opinion something more than pure interest or time preference payment, since he does assume a small measure of risk. The consumer's advance is often for long periods of time and it seems desirable to place some urgency or pressure on utility management to make some effective use of what might otherwise become sterile or unearning assets. A liberal loan rate of interest would accomplish this purpose.

Q. What rate of interest would in your opinion be fair and economical as a consumer credit in the case of the Pennsylvania Water & Power Company under present conditions? A. I am of the opinion that 3 per cent would meet all the requirements of equity and economy. It is more than pure interest, it affords a measure of risk compensation for such incidental risk as the consumer may be taking and is a rate which the utility enterprise will not find it easy to earn without the assumption of additional risks, hazards and uncertainties, yet it is not so high as obviously and certainly to prevent the earning of the intended rate of return on the [14688] investment.

Q. Why is the consumer not entitled to a credit, in effect equal to the intended rate of return for his advance payments on account of the cost of property at retirement as would result from the deduction of reserve balances for rate base purposes? A. Because of the sacrifice which the consumer makes does not merit such compensation.

The over-all intended fair rate of return must recognize and reward various economic functions or services. Among them are the reward for foregoing natural time preference, i.e. pure interest, a risk premium to compensate



the assumption of calculated hazards, compensation for the assumption of uncertainties—the incalculable hazards and for the assumption of otherwise uncompensated functions of management on the part of the investors.

Effective regulation would also hold out the prospect of additional return to induce and reward superior accomplishment.

Obviously, the consumer, by merely advancing a payment which he will eventually have to make anyhow does not perform these functions, he performs only the prepayment function and a minor amount of risk-taking.

[14689] A rate of interest equal to a liberal loan rate therefore compensates the consumer for what he does and sacrifices.

It does not make economic sense, or even common sense, to propose that the consumer be credited with compensation for functions which he does not perform and that the investor be denied compensation for functions which he does and must perform. To do so is disruptive and destructive of those fine relations of inducement and prospective reward which are needed to make a system of economic freedom work.

The consumer takes neither the risk of loss of principal or loss of income from the employment of assets generated by his prepayment. He assumes no responsibility for their management and when he has once paid his advance on the cost of property to be retired in the future he has met his entire obligation. When losses of income or principal on reserve assets take place management cannot in behalf of the investors ask the consumers for another contribution. It is the investor who takes the responsibility for the safekeeping of consumers' advances, takes the risks of their loss or failure to earn, for this he is entitled to compensation even as the consumer is paid for that function which he does perform by advancing payment.

Q. What are the economic factors that would limit and determine the fair rate of compensation for the consumers advance of the cost of assets at retirement? [14690] A. The fair price of such an economic sacrifice is to be determined by reference to the same principles which govern all price determination.

Merely because the consumer can be compelled to make such advances by law should be no basis for dealing unfairly with him and by the same token merely because the utility enterprise can be compelled to accept such advance payments should be no basis for dealing unfairly with them.

Although both parties to the "advance of the cost of assets upon retirement" may act under compulsion it is nevertheless possible to impute a fair price to the function performed and the benefit received. The fair price lies between two measures, what such advanced funds are worth to the utility enterprise and what the money advanced is worth to the consumers.

Certainly it is worth a long term pure interest rate to the consumer, as much as he could earn in alternative investments at no greater risk and hazard, thus at least a rate equal to what he could get on long term government bonds or high grade corporate securities.

On the other side funds advanced by consumers are worth no more than the price at which such funds could be obtained elsewhere on equally attractive terms. Whether an enterprise would want any such funds at a particular price would depend on whether it had a use for them at all or could profitably [14691] use them at the price. Certainly the maximum value and fair price for customer advances would not exceed (1) the price at which the enterprise could get such funds and (2) what return it could earn on them without the assumption of additional risks, hazards and uncertainties.

Between these limits the fair price of the consumer's advance will be found. It is obvious that whatever the exact rate is or should be, it is less, and substantially less,

than the over-all intended fair rate of return to the enterprise.

The governing economic principle is that those who take economic risk must be allowed to think they can obtain the reward for risk-taking. Any attempt to operate a free economic system in the reverse will end in drying up the willingness and disposition to assume risks.

Q. In what way and under what circumstances does the acceptance of the consumer advances by utility-enterprise impose additional risks, hazards and uncertainties on the investment? A. The acceptance of the consumer advance against the day when the cost of assets has to be met in retirements imposes additional risks and responsibilities from the time the funds are received until the enterprise comes into full ownership and control upon the occasion of a retirement of assets.

[14692] The acceptance of advances even if only as liquid funds for deposit in a bank imposes such hazards. In case the bank fails the loss is not a loss to the consumers who advanced the funds but of the investors, whose management accepted their custodianship. The same "advance" if lost cannot be collected again from the consumers.

In terms of the hazard-to earnings the enterprise takes the chances of not being able to employ the funds received either at once, advantageously or possibly at all. There are unavoidable lags in placing the funds in full and effective earning position.

Assuming that the consumer advanced funds are to be invested in securities the alternative is to invest under conditions which impose no substantial additional risk on the enterprise such as high grade bonds yielding 2.6-3.0 per cent or to invest in securities of higher yield and thus impose a greater risk on the investors.

If the investment is made in securities which did not increase the risk to the enterprise as a whole, the return will be less than the fair rate of return and the rate of return for the utility enterprise as a whole reduced. If



the investment is made in more hazardous securities the return over and above a relatively risk free rate would be earned by those who take the risk, the over-all fair rate of return on the investment might be earned or more nearly [14693] earned but only by the assumption of additional risk and uncertainty for which no compensation would be received by those who took the risk.

In the case of an expanding utility enterprise it might be assumed that consumer advances made to meet the ultimate cost at retirement might be temporarily employed in additions to property and plant. Aside from (1) the impracticability of immediate and full utilization of consumer advances for this purpose at all times and (2) the fact that sooner or later more or less of the funds so employed will be needed to serve the purpose for which they were allegedly accrued and (3) that investment in long-lived plant does not make them readily or certainly available to meet the cost of property retired at retirement, such expansion by the use of consumer advances imposes additional risks, hazards and uncertainties on the enterprise which are not voluntarily assumed except in anticipation of compensatory return.

When the utility enterprise assumes the responsibility for the investment of the consumer's advances in additional property the hazard base is increased for the investor's investment.

There is a larger property exposure to hazard. If the volume of business is increased proportionately there is greater exposure to fluctuation and at a greater leverage factor. When for rate base purposes the reserve balance (the [14694] consumers' net advance) is deducted the plant built out of such advances is in effect totally unearning and thus results in the adverse economic phenomena for the enterprise of the "larger wash and relatively smaller hang-out." The consumer by the device of full reserve deduction becomes a first priority claimant having a priority even over operating expenses and bondholder interest re-



quirements. The consumer in effect demands that the return on his "advance" be paid first by the method of not allowing it to become revenue at all. His claim becomes a checkoff, a discounted bill.

Rates based on investment less depreciation reserve take the consumer's return out in the form of lower rates. The consumer's return is not even exposed to the hazard of what can happen to revenues. Any scheme by which a special group of consumer "investors" can place themselves in priority and senior position to all other investors, not to mention employees and suppliers of materials, in fact enables them to take their return out before it is earned or even received as revenue and then claim a rate of return equal to that earned "across the board" by ordinary investors cannot but increase the proportion of the risk borne by the ordinary investor. A larger amount of property and a larger volume of service involve a larger measure of risk taking and the consumer creditor does not take this added risk and uncertainty.

[14695] The paradoxical character of the whole idea that consumer advances are entitled to special priority and position and a rate of return equal to that obtained by those investors who assume the risks and hazards of the enterprise becomes more apparent if the parties at interest are taken as represented by two groups of investors, Group A which has \$10,000,000 invested in Utility A and Group B which has \$5,000,000 invested in Utility B.

Group B proposes a merger under terms such as these: The new AB company will assign revenues receivable in an amount equal to  $6\frac{1}{2}$  per cent on the \$5 million investment of Group B investors.

The Group A investors get their return of  $6\frac{1}{2}$  per cent after operating expenses and taxes have been paid. After the addition of the property of Group B the total property exposed to risk will be 50 per cent larger, the volume of business, sales, customers will be 50 per cent larger. Then a ten per cent drop in business will be a 15

per cent reduction for the Group A investors, the ratio of expenses to "unassigned" revenue will be higher, the "above-the-line" leverage greater, in fact the entire investment of Group A exposed in every way to greater hazards and for no greater return.

Obviously Group A investors in their right minds will never voluntarily enter such an engagement but that is [14696] substantially what is demanded in behalf of utility consumers under proposals to deduct the total reserve balances from the investment for rate base purposes.

Q. Can a utility enterprise which has no opportunity or occasion for plant expansion solve the problem of large consumer advances without prejudice to its investors by disinvestment? A. I do not believe it can without prejudice to its investors. Several forms of disinvestment are conceivable even if not practical, and possibly not legal, but all of them in practical effect constitute a substitution of consumer capital for investor capital and as long or in so far as this would involve paying more for consumer capital than for presently employed capital it would prejudice the investor's position.

I understand that depreciation reserve assets may not be paid out as dividends and obviously if they were they would have to be recalled to some extent some time when needed to serve the purpose for which they were collected. Without reference to its legality disinvestment would under most circumstances be in large part impractical.

Equally important is the fact that the remainder of the investment would have assumed the responsibility for providing substitute funds when needed and such responsibility is not voluntarily assumed without prospect of compensation for [14697] the extra risk and hazard.

In any case disinvestment would counteract and destroy the intended and desired effect of adequate depreciation reservation and retention of such assets in the enterprise so as to enable it to meet its responsibilities certainly and economically in the retirement and replacement

of property, and substitute consumer advances for capital which was willing and able to bear its share of the enterprise risk at no more than a fair return for the service it was willing and able to give.

Q. Does the accrual of a depreciation reserve balance constitute a return of the investment made by investors to the investors? A. No. Reservations of revenue to meet the cost of enterprise-owned assets at the time of retirement do not constitute a return of the investment made to the investors or to anyone else.

Q. Why? A. For several reasons. First, the reserved revenue is not returned to the investors. The investors are those who own the securities of the enterprise, the bondholders and stockholders, and in the most important final sense, the stockholders. Merely entrusting an advance or prepaying on account of the cost at retirement of assets employed by the enterprise to the enterprise is not a return of the investment [14698] or of anything else to the investors nor is the enterprise in position to make such disposition of revenue received for restricted and special purposes.

Secondly, in no real and economically meaningful sense does the reservation of revenue in the name of "depreciation reservation" return the investment to the enterprise. The funds or other assets reflecting reservation of revenue against the day when the retirement takes place are collected and retained for restricted purposes. The enterprise is not free to dispose of such assets; it has a special and restricted responsibility with respect to so much of its total assets as are reflected by the depreciation reserve balance at any time.

In effect, the enterprise does not come into a full and unencumbered ownership of such assets until its rights in them have been matured by a retirement. At such time, having come into full and complete ownership, the enterprise has the right to draw down payment for assets retired at cost. Whether formally and specially tagged or



not, assets to the amount of the depreciation reserve balance are encumbered by a consumer interest, restrictions on their disposition and the practical limitations on their employment which make their position less than identical with unencumbered property.

The practical effect of revenue reservation against the day when assets are retired at cost is obviously, not a return [14699] of the investment to the investors. Moreover, it is clearly not even a return of the investment to the enterprise without strings and restrictions attached so important in their effect as to make the relationship of enterprise management to reserve assets realistically describable as a trusteeship of such assets until fully earned.

Q. Is the employment of assets, generated by depreciation reserve accrual, for the purpose of debt retirement a practical, fair and economical way of reconciling the economic interests created and involved? A. No. The use of assets generated by depreciation reserve accrual for debt retirement is a limited expedient and not an effective way to achieve economic balance except under certain limited circumstances.

Q. Why? A. In the first place, the permanent alienation of assets by debt retirement is not the purpose for which such assets were accumulated. In so far as the assets reflected by depreciation reserve balances were accumulated and are or still will be needed for retirement and replacement purposes, they can at best be only temporarily employed for debt reduction. The use of reserve generated assets for debt retirement is therefore only one among several possible temporary uses of such assets by which some income or savings can be obtained by the enterprise to reduce the cost [14700] to itself of asset retirement cost anticipation.

The effect and consequences differ little from that of any other comparable use of the assets generated by the prepayment in part of the cost of assets at retirement. A utility burdened with such prepayments could invest in



the 3 per cent bonds of some other enterprise, could invest in and keep alive some of its own 3 per cent bonds or, conceivably, so far as the law might permit, retire its 3 per cent debt.

The alternative effect would be somewhat different depending upon individual circumstances. Debt retirement might be somewhat more expensive on account of the terms and conditions under which bonds could be retired, the investment in the bonds of other enterprises could be diversified and thus, without unusually large holdings of any particular security, there might be available a better resale market for such securities after the assets invested in them were required to be made available at retirement for the purpose for which their accrual was required or permitted.

The important distinction under the assumptions made is that the burden and responsibility of providing the funds with which to make replacements which is clearly the burden and responsibility of the equity investor and his management may be much greater if the company debt is retired to save the 3 per cent interest than if an investment in a [14701] diversified group of 3 per cent marketable bonds is made. Whether new financing can be accomplished when and as needed at what cost and how economically the funds could be provided in the volume needed and when needed are financial hazards for the equity investment.

However, even more important is the fact that any such employment of assets generated by depreciation reservation would yield less than what the "trusteeship" by the enterprise for such assets would cost the investor if the reserve balance is "deducted" from the investment for rate base purposes.

Under these circumstances, the equity investor would be engaging in a negative "trade on the equity" paying on the one hand the fair rate of return for the use of such assets and on the other, receiving a bond rate of interest from their employment.

The economic effect and consequence of the use of assets generated by depreciation reserve accrual for enterprise debt retirement is to substitute consumer advanced capital at a price equal to the fair rate of return, assuming  $6\frac{1}{2}$  per cent, for investor-advanced debt capital at 3 per cent. Determination of the adverse effect on the earnings of the equity investment requires only a simple arithmetic calculation for extensive debt reduction would obviously destroy the quality of the capital structure and eliminate the advantage which existed in the use of debt capital and which [14702] would eventually be reflected in the requirement of a higher rate of return.

If, however, instead of deducting the balance for rate base purposes the administratively simple device of a liberal risk-free rate of interest credit to the reserve balance is used or the sinking fund method at a comparable risk-free rate of interest is employed, the alternatives mentioned above become more feasible in at least the last respect. Investment of reserve generated assets at 3 per cent in the bonds of other enterprises, its own bonds or, to some extent, even debt retirement would operate to keep a fair balance between the cost which the enterprise experiences by accepting prepayment of the cost of assets at retirement and the extent to which it can by outside or additional income reimburse itself without the assumption of additional risks, hazards and uncertainties. The difference in effect, assuming legality, would arise out of the difference in the amount of risk and responsibility the equity would take under the alternatives with respect to being able to get funds when it needed them in the amounts needed and at equally favorable costs.

[14705]

CROSS-EXAMINATION.

By MR. GOLDBERG:

Q. Dr. Dorau, in the Safe Harbor case you appeared as a witness in behalf of the Respondent in that case, Safe

Harbor Water Power Corporation. Isn't that right? A. Yes.

Q. In that case you set forth and testified to your conclusions and principles about certain matters of general depreciation principles and policy. Isn't that right? A. I think that is a fair description.

Q. And the conclusions and opinions that you expressed in that case are the same ones you have expressed in your direct testimony in this case. Isn't that right? A. I don't know of any portion of the direct testimony prepared for this case that is in any way in conflict with what I may have offered in the other case.

Q. Of course, you understand that my question went only to the principles that you apply to what you call the facts of the case. You understood that? A. Oh, I assume you were not concerned about the identity of mathematics and quantities.

Q. That is right. [14706] A. I was trying to make it clear that I was not in a position to pass judgment on that alleged degree of similarity.

Q. Yes. A. I was merely wanting to go on record that so far as I know there is no conflict in principle or position in any part that may deal with the same questions.

Q. As a matter of fact, in the Safe Harbor case you testified that the principles expressed by you were applicable to any set of facts or circumstances. Isn't that so? A. No. Any set of facts that had the same area of origin and application.

Q. What do you mean by the same origin and application? A. I am sure they don't have the same application in the case of the General Electric Company or a chemical company.

Q. How about electric utilities? A. I think substantially in the case of electric utilities, except possibly those instances that are under special sliding scale franchises, or something of that character.



Q. Are Safe Harbor or Penn Water in that category, within the exception? A. No, I don't believe I would except them.

Q. I think the premises upon which you founded your testimony in the Safe Harbor case are the same premises upon which you base your testimony in this case. Isn't that so? [14707] A. Insofar as that covers economic principles, yes.

Q. Yes, economic principles of depreciation. A. Yes, sir.

[14718] DIRECT EXAMINATION (Continued).

By Mr. HULL:

Q. First, Doctor, I wish to direct your attention to Mr. Dunn's testimony at transcript 13,427. I will read to you the relevant portions.

MR. GOLDBERG: May I just get that?

MR. HULL: Yes.

MR. GOLDBERG: I have them now.

MR. HULL: I propose to read to the witness the question beginning at the top of transcript page 13,427, lines 1 to 4, and the answer of the witness at lines 11 to 15, the following question appearing at lines 16 and 17, and the answer of the witness beginning at line 22 and continuing to the end of the page.

By Mr. HULL:

Q. Dr. Dorau, the testimony I have referred to is as follows:

"Q. Now, when an electric utility company invests the assets reflected by the depreciation reserve balance, who assumes the hazard of the loss of that capital or failure to earn the return of that capital?"

I may say, I think there is a typographical error there. That should have read "earn a return on that capital."

The answer of the witness was:



[14719] "I cannot answer the question in the terms it is put because the assets represented by the depreciation reserve cannot be identified, so I cannot tell what risks, if any, are involved in connection with such assets.

"Q. Even though they cannot be identified they are there, are they not?

"A. Not necessarily there. To the extent they are there and the utility company receives a fair rate of return on such assets, unidentified assets, there is no particular risk involved other than the risks included in the rate of return."

Now, Doctor, my question to you is this:

Do you agree that when an electric utility company invests the assets reflected by the depreciation reserve balance, that "there is no particular risk involved other than the risks included in the rate of return"?

MR. GOLDBERG: I object to that, Mr. Examiner, because the reference has not been to all of the testimony and all of the testimony is needed. The question is based only upon a fragmentary portion of all that testimony.

TRIAL EXAMINER: Objection is overruled.

By MR. HULL:

Q. Do you have the question in mind? A. I lost the question. May I have it, please?

[14720] (Question read.)

THE WITNESS: No. It seems to me the conclusion is in error in that the investor does assume the additional risks incident to the additional investment or employment of such reserve revenues.

By MR. HULL:

Q. \* \* \* Now, Doctor, my question to you is this: In your opinion does the fact that an electric utility company has not segregated and ear-marked specific assets as invest-

ments of [14721] cash generated through charges for depreciation, or does the fact that the specific assets cannot be identified as having originated from such charges, do either of those facts mean that the company has no assets which are reflected by the balance in the depreciation reserve?

. . .

[14722] THE WITNESS: No.

. . .

Q At the portion of the testimony to which I last directed your attention, Mr. Dunn referred to the reserve for depreciation as a contra account to the plant account, and at a number of other places in his testimony, particularly at pages 13438 to 13440, he referred to the fact that in his opinion the reserve for depreciation was merely an account contra to plant account.

In your opinion is the reserve for depreciation simply and merely a contra account to plant account?

. . .

[14723] THE WITNESS: No, it is not my understanding that it is primarily that or simply that. The balance in the depreciation—

. . .

[14724] —account measures the reservation of revenues accrued on account of the ultimate retirement of property at cost which has not been required to meet such retirements of cost.

By MR. HULL:

Q. Doctor, what is the purpose of the reservation of assets that are incident to the accumulation of credits to reserve?

. . .

THE WITNESS: The purpose for reserving revenues is to provide assets sufficient to meet the cost at retirement. The purpose of the depreciation reserve is to record the balance of such reservations not previously required for retirements.

By MR. HULL:

[14725] Q. Now, Dr. Dorau, at transcript 12,809, lines 15 to 20, Mr. Dunn was asked the following question:

"Do you agree that when the depreciation reserve balance is deducted from the original investment and a depreciated rate base is used in fixing rates the utility company must assume the risk of investing the assets reflected by the depreciation reserve in some manner in order to earn upon them the utility rate of return?"

The answer to that question is found at transcript 12,810, lines 4 to 6, as follows:

"There are several answers to the question. They certainly don't take any additional risks without receiving a rate of return greater than the commission allowed."

Then at lines 18 to 19, after the witness had been asked concerning the investment of such assets, he was asked this question:

"Suppose it is lost, who has to replace it?"

"A. No one has to replace it."

My question to you is this: Do you agree with Mr. Dunn that if the assets reflected by the depreciation reserve balance are invested by the utility and are lost that no one has to replace them?

. . .

[14726] THE WITNESS: No, I do not agree.

By MR. HULL:

[14727] Q. At transcript page 12,767, beginning at line 14, the following appears, Mr. Dunn being on cross-examination:

"Q. When an electric utility company finds it necessary to use capital for the replacement of property, what sources of capital are available to it?"



"A. Its own funds are available, money borrowed by means of notes, bonds, the sale of additional capital stock are the principal sources of funds.

"Q. It is true, is it not, that the sole and undivided responsibility of an electric company to provide such necessary capital is the responsibility of the stockholders?"

That last question was not answered by the witness. I would like to have your opinion on that question.

MR. GOLDBERG: Mr. Examiner, I object to that, and particularly the statement that the last question was not answered by the witness because I had objected to that and the Examiner sustained my objection as appears on line 24 of transcript 12,768. How much of this distortion is to be permitted, Mr. Examiner?

. . .

[14728] THE WITNESS: Yes.

. . .

Q. Dr. Dorau, in your opinion are the assets reflected by the reserve for depreciation of an electric utility company assets which are devoted to public service? A. Yes.

Q. Will you give your reasons? A. Whether actually invested in property or [14729] not, whether invested in other opportunities for earning a return or not, the assets reflecting a depreciation reserve serve in the sense that they are retained in the enterprise available for reinvestment in property upon retirement of existing property.

Q. Can you give me any analogy of other temporarily idle assets that a utility company has on which it is allowed to earn a utility rate of return?

MR. GOLDBERG: May I have that question?

TRIAL EXAMINER: Yes.

(Question read.)

THE WITNESS: I think the principle that capital necessarily and unavoidably, partly or wholly unearning because of the public obligations of the utility enterprise for continuing service, are recognized, for example, in the recognition given in interest during construction, as an element of cost. That has come to be recognized on the basis that capital is unavoidably and necessarily unearning in whole or in part even before any service may be rendered to the consumers.

Similarly, working capital, for example, may not continuously and fully be employed. Nevertheless, it has to stand by and be available for the functions which it has to perform and has come to be generally recognized as an appropriate base for earnings.

[14730] Q. Do you find any analogy in utility property held for future use? A. Well, similarly property that is not actively employed in rendering service now but is construed as reasonably necessary for future requirements or for possible present requirements which actually do not materialize has come to be recognized in appropriate amounts as deserving of recognition as a basis for a return.

Q. At transcript page 12,722, lines 11 to 15, the following question was asked of Mr. Dunn on cross-examination:

"Now, Mr. Dunn, the effect of the deduction of the reserve balance from original cost in determining a rate base is to reduce the amounts which the consumers pay in rates by the amount of the rate of return multiplied by the depreciation reserve balance, is it not?"

In attempting to secure an answer to this question, a long series of questions was asked thereafter extending over to transcript page 12,732, and an illustration was put to him of a company beginning business with a plant account of \$100,000 and capital stock of \$100,000.

The estimated life of the plant was ten years, and the amount of reserve for depreciation at the end of the first year was \$10,000.

The last question of this series at transcript 12,732, lines 15 to 23, is as follows: °

[14731] "Q. Mr. Dunn, assuming that the \$10,000 which is charged as depreciation expense in the first year and paid for by the consumers is retained by the company in cash, does not the deduction of the amount of the depreciation reserve balance of \$10,000 from the original investment rate base of \$100,000 and the charging of rates for the succeeding year upon the rate base of \$90,000 have the effect of allowing the consumers in the second year the rate of return multiplied by the assets affected by the depreciation reserve balance?"

The answer was:

"No.

"Q. Why would it not have that effect, Mr. Dunn?

"A. Because the only reduction which the rate payers are entitled to and which they receive is the reduction due to the deduction of proper balance in the depreciation reserve. Any assumed rate of return applied to a cash figure in the company is not equivalent to that determination."

Do you agree with Mr. Dunn's answer?

. . .

[14732] THE WITNESS: No, I do not agree because it seems to me to be perfectly obvious that the effect of deducting depreciation reserve balances from the property account does in effect credit the consumers with a rate equal to the earning rate.

By MR. HULL:

Q. Do you know of any regulatory commissions which have prescribed or approved the sinking-fund method of accounting for depreciation? A. Yes.

Q. Do you know of any courts that have approved that method? A. I have them of record. I don't have them in mind. Yes, there are such approvals.



**Q.** Does the sinking-fund method of accounting for depreciation as approved by the regulatory commissions and courts to which you refer provide for the charging of the annuity component of the sinking fund only to depreciation expense and provide for the interest component as an income deduction?

**MR. GOLDBERG:** I object to that as utterly immaterial and irrelevant, Mr. Examiner.

**TRIAL EXAMINER:** The witness may answer.

[14733] **THE WITNESS:** It is my understanding, and I recall no exceptions to it in regulatory procedure that I have had the opportunity to review to the method which involves charging the annuity above the line to operating expenses and the interest credit below the line as an income deduction.

**By MR. HULL:**

**Q.** When an interest method of accounting for depreciation is used, and both the annuity and the interest components are charges to depreciation expense above the line, what designation is given to that method? **A.** It has come to be known as the compound-interest method.

**Q.** At transcript page 12,519, lines 17 to 19, Mr. Dunn testified as follows:

"The use of the sinking-fund method with an interest rate lower than the rate of return would be an application of the sinking-fund method in an improper manner."

**Do you agree with that?** **A.** No.

**Q.** Among the cases decided by Commissions and Courts to which we referred a moment ago, do you know of cases in which the sinking fund method was prescribed or approved with an interest rate lower than the rate of return.

**MR. GOLDBERG:** I object. It is immaterial and irrelevant, Mr. Examiner.

[14734] **TRIAL EXAMINER:** The witness may answer.

**THE WITNESS:** Yes, I know of such instances.

**By MR. HULL:**

**Q.** Can you tell us why the rate of interest is and should be less than the rate of return? **A.** Well, in summary because the enterprise finds it difficult, if not impossible, to a greater or lesser extent, to give full and effective earning power to such reservations of revenue and, secondly, insofar as it employs such assets resulting from the reservation of revenue and assumes risks greater than what may be construed a fair and reasonable risk free loan rate, it takes on additional hazards, risks, and uncertainties for which it, the enterprise, is entitled to compensation.

**Q.** Under any method of depreciation reservation, in what manner should the balance in the reserve for depreciation be treated in the determination of a rate base?

**MR. GOLDBERG:** May I have that question, please?

(Question read.)

**MR. GOLDBERG:** I object to that, Mr. Examiner. I know of no foundation for that question.

**TRIAL EXAMINER:** Objection is overruled.

**THE WITNESS:** May I have the question again, please?

(Question read.)

**THE WITNESS:** The reserve balance in my opinion should [14735] always be treated as reflecting the reservation of such an amount of revenue of necessity retained in the enterprise not deducted for purposes of rate base determination but used as a basis for an appropriate interest credit to the consumers' account on account of such risk-free employment of funds as the enterprise may be able to make or may fairly be presumed to be able to make.

By MR. HULL:

Q. In the operation of an electric utility enterprise, upon whom does the obligation rest for securing capital necessary for replacements of property?

THE WITNESS: Ultimately upon the equity investment; practically upon the management which represents that equity investment.

[14736] Q. Doctor, assume that the assets reflected by the depreciation reserve balance had been used to retire three per cent bonds, and that subsequent retirements and replacements of property required the company to reobtain capital which can only be obtained at the rate of five per cent or higher. Who bears the burden of the additional cost, the equity holder or the consumer?

MR. GOLDBERG: May I have that question, please?

TRIAL EXAMINER: Yes.

(Question read.)

[14737] THE WITNESS: The equity holder obviously immediately bears the burden of the adverse change in the cost of money. If I may explain my answer further, I do understand the operation of the regulatory process and that it is a fair presumption that under that regulatory process when and if subsequent rate determinations take place that to some extent, at least, the five per cent cost of money would then be recognized as a factor affecting the fair rate of return.

But in between times, obviously, the equity investor bears the economic disadvantage of having traded five per cent money for three per cent money.

MR. HULL: May I have the answer, please?

(Answer read.)



By MR. HULL:

Q. Is that right? A. Having been traded out of five per cent money into three per cent money.

[14738] Q. What risk does the consumer of Pennsylvania Water & Power Company take with respect to the assets reflected by the depreciation reserve? A. I don't see that they take any significant additional risks. They have made an advance against the time when the cost of retirement needs to be met. They certainly don't under our ordinary conception of the regulatory process stand liable to pay again in case the enterprise loses these assets collected from them, and in contrast to that the equity investor has to assume all the responsibilities of care and management and safekeeping of these assets advanced and reflected by depreciation reserve balances.

[14743] Q. Dr. Dorau, since as you testified this morning the consumers assume no risks in connection with the assets reflected by the depreciation reserve balance, is it in your opinion equitable for the consumers to receive a credit on those assets equal to the rate of return? A. It is not.

Q. Is the allowance of so large a credit in your opinion justified by sound economic principles? A. It is not.

Q. Upon sound economic principles to how much return upon those assets, or how much credit on those assets, are the consumers entitled? A. From an economic point of view they are entitled to full compensation for the time value of the funds advanced plus, in my opinion, a modest allowance over and above that so as to equal a liberal loan rate of interest, in part to act as a stimulus to the management to make the [14744] best possible use of those assets in the meantime.

Q. Doctor, have the opinions which you have expressed today and the principles you embodied in your rebuttal tes-

timony been recognized by the regulatory commissions of any of the states?

[14745] THE WITNESS: Yes, they have been frequently recognized.

By MR. HULL:

Q. Can you tell us what states? A. Well, some years ago I provided a substantial document which recorded a large number of instances of that recognition and the employment of the sinking fund method. The states of Wisconsin—

TRIAL EXAMINER: This was some years ago, you say?

MR. HULL: Yes, I made such a careful tabulation and calculation of those.

TRIAL EXAMINER: How long ago?

THE WITNESS: By Mr. Goldberg's request.

MR. GOLDBERG: By me?

THE WITNESS: Yes, at your request.

MR. GOLDBERG: Do I have a copy?

THE WITNESS: You were provided with a copy.

TRIAL EXAMINER: How long ago was this?

THE WITNESS: Safe Harbor rate case.

MR. GOLDBERG: Before the decision, was it not?

[14746] THE WITNESS: Quite so.

MR. GOLDBERG: If it was ever provided.

TRIAL EXAMINER: Just a minute.

How long ago was that, Mr. Witness?

THE WITNESS: I suspect that is a matter of two years, at least; two and a half years maybe.

MR. GOLDBERG: Direct testimony of Dr. Dorau was December of 1944.

THE WITNESS: Then probably in February. I think it was along in February of 1945.

MR. GOLDBERG: First cross-examination was February 27th, 1945, Mr. Examiner.

TRIAL EXAMINER: This is more or less a matter of argument. You determined this from the reported decisions of the various State Commissions?

THE WITNESS: That is right.

By MR. HULL:

Q. Are you familiar, Doctor, with Order No. 38-A of the Missouri Public Service Commission?

MR. GOLDBERG: I object, Mr. Examiner. It is immaterial and irrelevant.

TRIAL EXAMINER: He may answer.

THE WITNESS: Yes, generally familiar with it.

By MR. HULL:

Q. Does that follow the principles which you have [14747] enunciated in your rebuttal testimony?

MR. GOLDBERG: Same objection, Mr. Examiner.

TRIAL EXAMINER: You may answer.

THE WITNESS: Yes, so far as I understand Order 38-A, it is in harmony with the principles which I have discussed. The Missouri Commission provides for a 3 per cent credit on depreciation reserve balance.

By MR. HULL:

Q. And an undepreciated rate base, does it not? A. Yes.

Q. If the retention in the electric utility business of the assets reflected by the depreciation reserve is required by regulatory practice, who should bear any cost or burden incident to the retention of those assets? A. The consumers should bear any extra burden over and above that



which can be reimbursed by the employment of such advances under comparatively risk-free circumstances.

CROSS-EXAMINATION (Continued).

By MR. GOLDBERG:

[14758] Q. I understood you to say that the purpose of the reserve is to meet a future cost of retirements when the retirement is made. Is that right? A. That is right.

[14779] Q. Did you begin with the year 1946 in Schedules E, F and G for the sake of brevity? A. Yes, and because my purpose was to project the results of the application of alternative methods into the future.

Q. So that at least in part you ignored 35 years of past operations for the sake of brevity but concerned yourself [14780] with 65 years of estimated future operations. Is that right? A. The effect of that is correct but it was not my intention to do a historical analysis. The purpose was to show what the results would be of alternative methods projected into the future.

Q. And you think that can be shown by ignoring the past? A. I would like to assume that the past was not totally ignored in the FPC Staff assumptions as to lives.

Q. I am talking about what you did. A. So to that extent presumably actual experience may have entered the determination, but I made no such determination.

Q. Can you reach correct conclusions as to the future for your purposes by ignoring the past? A. As correct as the FPC estimates of life expectancy.

Q. You eliminated the return earned during the 35 years of actual operations when you purport to show the [14781] cumulative rate of return in Schedule E-1. Isn't that so? A. That is correct. I was not making a post-evaluation of the return of the company in the past. I was

showing only comparatively what it would be in the future under the alternative methods.

Q. You were not making a fully cumulative return, showing you were making only a partial one. Isn't that so? A. Making it from 1945 in.

Q. Only partially, that is you were showing nothing as to the past which might be reflected in the figures? A. Never intended to.

[14786] Q. Looking at your Schedule E-1 in Exhibit 321, you have a column which is entitled "Deficiency in return." You have so entitled that column as a result of your assumption that the fair return should be computed on undepreciated investment. Is that right? [14787] A. That is correct.

Q. If, however, it is intended that the fair return be computed on depreciated or net investment, then, of course, the "deficiency in return" is the "excess in return", isn't that right? A. It could be so called, a mathematical excess.

[14795] Q. Is depreciation the amount accumulated in excess of a fair rate of return? A. Depreciation is never that. If I may correct you, does the reserve reflect—

Q. Accumulations from earnings in excess of fair return. A. Not necessarily, no.

Q. In other words, there are times when you will have reserve accumulations even though the depreciation is not [14796] earned? A. Put it this way: The necessity of giving priority to a reservation for depreciation has a claim ahead of any indicated return to the enterprise. Therefore, if there is anything over and above operating expenses, it first goes to the reserve.

Q. Is it your statement— A. Not since about 1918 and 1920, Mr. Goldberg, has that kind of accounting been engaged in to my knowledge.

Q. Is it your statement that where the company does not earn a fair rate of return it has nevertheless received the depreciation payment from the consumer? Is that right? A. It may well have.

[14803] Q. When you refer to "a 2 per cent or 3 per cent return on the assets reflecting the depreciation reserve balance", the percentages referred to by you are hypothetical and so are the assets. Isn't that so? A. The percentages are a convenient range of percentages in even amounts for ease of calculation, zero, 2 and 3. The percentages were stopped at 3 because in my opinion there is no prospect under present conditions of earning as much, even, as 3 per cent without the assumption of additional risks, hazards and uncertainties, so I did not go beyond 3 per cent. I couldn't go below zero.

Q. They are hypothetical and assumed percentages, aren't they? A. I don't know about hypothetical in that sense. There is nothing hypothetical about 2. It is a very real number.

Q. Did the company earn the 2 or 3 per cent you used? A. That is a different question. No, I made no determination of what the company earned.

Q. So far as that is concerned, then, it is a hypothetical percentage, hypothetical income. Right? A. Well, it is not intended to be a picture of the income of the company which it was able to earn on the assets reflecting its depreciation reserve balance.

[14808] Q. If the assets reflecting the depreciation reserve balance had been used to retire bonds, have they been retained? A. If they had been used?

Q. Yes. A. Under your assumption if they had been used, obviously they wouldn't.

Q. Do you know whether assets reflecting the depreciation reserve balance have been so used by Penn Water?

A. No, without an analysis of this statement I could not say whether they had or had not.

[14809] Q. And you have made no such analysis? A. I made no such analysis but I wouldn't be a bit surprised if it couldn't be made with some time. I don't think I would assume the extemporaneous analysis of a balance sheet—

Q. You never made one in connection with the testimony you prepared here? A. I did not do that, no.

[14836] Q. Now, then, although you have, for the sake of brevity, depicted alleged deficiencies in return beginning with 1946, it is the fact, is it not, that in your depreciation reserve calculations you began with January 1, 1911.

[14837] Right? A. That is right.

Q. Are we to understand that you propose a retroactive adjustment of the depreciation reserve? A. No, I have made no such proposal.

[14840] Q. I think you will find it is the same thing you did in the Safe Harbor case. A. Oh, no. I didn't, you did.

Q. In connection with my statement that in the Safe Harbor case you made a showing with respect to the entire past history of the company and the projected history on a cumulative basis, I show you Table 4 of Exhibit 53 in Docket

[14841] Number IT-5914. Now having had an opportunity to refresh your recollection didn't you in that case show cumulative rates of return based upon the entire history of the company from 1933 to the year 2032, past and projected?

A. It would appear so. I withdraw my remark and apologize for the lapse of memory.

Q. But you have not done that in this case. A. No.

[14847] Q. What additional risks, hazards and responsibilities are the common stock investors assuming by that in-



vestment in Safe Harbor common stock? A. The hazard of non-receipt of income or loss of principal.

Q. Is that reflected in any way by the rate of return on the common stock? A. Quite so. I think that is the best evidence that it is a risky undertaking.

Q. In other words, for assuming those additional risks, hazards and responsibilities they are going to receive 9.33 per cent dividends. Right? A. That is correct. Wait a minute, that is not quite correct. I am trying to be perfectly candid. For the assumption of the risks, hazards and uncertainties involved in this investment they are receiving that part of 9.33 per cent which is over and above what we have called a comparatively free, risk-free rate of return. Namely, if we may illustrate it by saying three per cent, again as I have, then 6.33 out of the 9.33 would be construed as the return to the investors here for assuming the additional risks and hazards [14848] of an investment in the Safe Harbor stock over and above employing those same assets in comparatively risk-free three per cent bonds.

. . .

[14891] Q. You did not use the actual retirements for that period of time in connection with your computations shown in Exhibit 321; right? A. No, I did not, and I could not have to accomplish the purposes which this exhibit was intended to accomplish.

. . .

[14942] Q. So that you are to be understood as saying that though the Commission, if it wishes, may use a depreciated rate base, it may do so only if it makes an adjustment in the fair rate of return so as to equal the fair rate of return on total or undepreciated investment, right? A. Yes, all other factors being consistently handled the purpose of the "G" series here is to show that the Commission could pursue the mechanics of a deduction process for rate base purposes and make the necessary adjustments quite simply in rate of return to get the effect that it would have gotten had

it calculated its return on the total investment of the investors.

[14947] Q. Isn't this the fact: That in the event that assets reflecting the depreciation reserve balance could not be identified, it would follow that no income could be identified as having come from those assets? A. I think the way I understand it it is obvious. If you can't identify the assets you couldn't identify the flow of income. But that doesn't mean to say there was no income necessarily, simply because of the first statement that there is no identification.

Q. You would say that the company has the right to assume assets reflecting the depreciation reserve exists and that there is income from such assets, and that the income that it earned was attributable at least in part to those [14948] assets. Is that it? A. I think so. If you can't identify the assets you probably can't identify the income.

Q. Could a company assume that its assets reflecting the depreciation reserve balance are all in the bank? A. You couldn't stop them from assuming that, no.

Q. It has that prerogative. A. Circumstances are obviously that it could make such an assumption.

Q. It could make such an assumption? A. Yes.

Q. And having made such an assumption it could then assume there is no income. Is that right? A. If there were no income it would follow very logically that it might also as well assume there was no income, if in fact there were no income.

Q. It doesn't know if it can't identify the assets. A. You assumed they were identified.

Q. Yes, it assumes that they are in the bank. Having assumed they are in the bank it may assume there is no income. Right? A. It might. But I say if in fact there were none. It is possible to earn a little return on bank balances at times. If you put it in a time account you could get some percentage on it.

[14949] Q. How much? A. Maybe one per cent today.

. . .

[14957] Q. Now, if I understand what you just told us in these illustrations, whether the assets reflecting the depreciation reserve balance are invested inside the company or outside the company, there is an assumption of additional risks, hazards and responsibilities. Right? A. Depending on the character of the investment, Mr. Goldberg.

Q. Over and above this three per cent? A. All right, fine.

Q. With that, the answer is "Yes"? A. If it is above the three per cent.

. . .

[14958] Q. Is this the fact: Whether deposited with a trustee or not, the fund or assets reflecting the depreciation reserve balance you consider a trust fund? Right? A. I think I have in some connection or other stated in effect a trust fund.

. . .

[14982] Q. Does it take any cash to retire property except expenditures for removal or demolition? A. No. The retirement as such does not, particularly if we construe a retirement as a bookkeeping operation.

Q. I was not construing it as anything at all. A. You mean actually physically putting it out of service?

Q. Speak of it in that way first, actually physically taking it out of service, does it require any cash except expenditures for removal or demolition? A. No.

Q. As a "bookkeeping operation" does it require any [14983] cash? A. There is only the cost of the bookkeeping.

Q. Now, then, in what circumstances is there a cost of retirement which involves the utilization of cash other than cash for the bookkeeping operation or the removal or demolition of the physical property? A. The retirement as

such does not require any cash. The operation to which I referred is the replacement.

[14997] Q. There is one life assigned for the turbo generators in Exhibit 59. Is that right? A. That is right.

Q. Did you understand that that one life assignment meant that all of the turbo generators would be retired at [14998] the same time? A. I understand that such turbo generators might not be actually retired at one time. In fact, I understand very well that they may not be retired at all according to such a forecast, but they were given a specific life and it is that life I used to project the period of their existence in the account from the date of installation to the date of estimated retirement.

[15050]

WM. H. EICHHORN, JR.

CROSS-EXAMINATION (Continued).

By MR. GOLDBERG:

[15062] Q. Now we come to the Schedule K series which begins on page 34. If I understand the make-up of this from what you told the Examiner the other day, you have broken down the Schedule K items into three classifications; is that right? A. That is correct.

Q. Did you make the breakdown or did Mr. Wetzel make it? A. I asked Mr. Wetzel to make the breakdown.

[15063] Q. The breakdown between betterments, additions, and replacements, then, represents his conclusions as to the appropriate segregation; is that right? A. Yes, with this understanding—that when we made the original cost determination, there was a large group of items which fell into this classification of betterments, additions, and replacements, and they were treated as one total group at that time, and what is done in Exhibit 320 in the K sched-



ules is to divide up the remaining ones which were not recommended for allowance by the staff in Exhibit 51.

Q. I understand that you concluded that these amounts shown for the three categories on page 34 were accounting errors, or, as you stated it the other day— A. I participated in that joint determination that these were accounting errors.

Q. When you say "joint determination," I take it that means that you were in accord with the conclusions, and it also represented your own independent conclusions; right? A. I saw nothing wrong with it; that is right.

Q. You agreed with the conclusions; right? A. I think that is similar.

Q. All right, if you are using it in that sense. I would like to see if we can cover them as a whole without [15064] going into all of the details, for the sake of saving time.

Now, then, upon what standards, or what standards did you apply in reaching the conclusion that these amounts were erroneously charged either to operating expenses or to the depreciation reserve? A. First of all, these items appeared in the physical inventory, and there was no cost found for them in the plant accounts, so that since they represented physical property and were part of the plant in service, I considered, along with Mr. Gunn and counsel, the system of accounts of the Federal Power Commission instructions—electric plant accounts 2-B as permitting inclusion of those items as part of plant cost.

Q. I take it that you are referring to the last sentence, electric plant accounts, instruction 2-B, which appears on page 38 of the Commission's Uniform System of Accounts? A. Yes.

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[15065] Q. If the charges, when made, were made pursuant to accounting practice then in effect, you understood instruction 2-B to forbid re-accounting for them; isn't that so? A. No, that is not what I understand instruction 2-B to mean.

Q. Will you give us your understanding of what you understood it to mean? A. Instruction 2-B, I believe, speaks clearly for itself, and I know that you left out of your question the words, in instruction 2-B, "Charged to operating expenses in accordance with the Uniform System of Accounts in effect at the time."

Q. Go on. A. That is all.

Q. What did you understand "charge to operating expenses in accordance with the Uniform System of Accounts in effect at the time" to mean? A. Well, to me it meant that if the Uniform System of [15066] Accounts in effect at the time entry was made required items to be charged to plant account, and they were not so charged, they could be corrected under instruction 2-B.

Q. What did you understand "Uniform System of Accounts" meant? A. To me this meant, in this particular instance, the Pennsylvania Commission system of accounts which was in effect during the recording of these entries by Penn Water.

Q. All of these entries, are you saying, which appear in Exhibit 320 on the K schedules were made at a time when the Pennsylvania Commission's system of accounts was in effect? A. I believe they all were. Let me look at this for a minute.

Q. Do you know when the Pennsylvania system of accounts went into effect? A. January 1, 1919, is the effective date of one uniform system of accounts of the Pennsylvania Commission, the one that I have here.

Q. Was that the one which was in effect during the time that the entries in the K schedules were made? A. I believe it was.

Q. The earliest item I find in glancing quickly through the schedules appears on page 45. Item 26 appears [15067] to have been made in several years—1912, 1913, 1914; is that right? A. Those particular ones, '12, '13, and '14, are the only ones that I know there.

Q. The only one I found which was earlier than 1923.

A. That is correct.

Q. That one was made before the 1919 system of accounts; this particular one, I believe it is proper accounting to include it in capital, even though the system of accounts was not in effect at the time.

Q. Do you consider that electric plant accounts instruction 2-B does not apply where there was not in effect a "uniform system of accounts" in the sense in which you have referred to the Pennsylvania system of accounts? A. No, I think that that is one, only one of the bases for making the corrections shown in the K schedules. I believe it does not violate accounting principles to make that correction, in any event.

Q. All right. That is because, as I take it, you say properties are in the physical inventory, and there is no cost associated with that property; is that right? [15063]

A. We were asked to determine original cost and we had the property.

Q. You were asked to determine original cost within the confines of the instructions of the uniform system of accounts; is that right? A. Yes.

Q. I am trying to find out from you whether you construe the phrase "uniform system of accounts" as meaning a system of accounts prescribed by some regulatory commission. A. That is what I took it to mean, yes.

Q. In other words, you did not take it to mean in accordance with the accounting practices being followed by the utility? A. No, I don't think you would normally speak of that as a uniform system of accounts.

Q. At least, you did not think that is the sense in which it was used? A. That is right. Something uniform has to be used by more than one person or more than one company to be uniform.

Q. Then, did you understand it to mean accepted practice among utilities, even though such practice was not pursuant to a system of accounts prescribed by regulatory bodies? A. No. I took this to be a prescribed system of [15069] accounts by some authority.

Q. I see. Now, we have here only one item, you say, in which entries were made when there was no system of accounts. A. That is right.

Q. What is that Item No. 26? A. As I understand it, it is construction plant buildings which remained over after the initial construction at Holtwood.

Q. You mean after construction ceased, these buildings remained in existence and were used for operating purposes; is that right? A. I don't believe they were used for operating purposes. I think that is the reason they were charged off in 1916. They were not usable.

Q. Can you describe these buildings? Were they shacks or something? A. No, I cannot. This is the residue of the construction plant buildings account which had not been charged off, so that you could not identify from the records the exact buildings.

Q. You are unable to determine what buildings are involved; is that it? A. That is correct.

Q. If I get the picture, you are saying that these [15070] construction plant buildings were charged off because they were not used after construction ceased? A. That is my understanding, yes.

Q. And you have found no information indicating their use; is that right? A. I am informed by Mr. Wetzel, who is familiar with the details of the K schedules, as I previously testified, that the buildings were used from time to time for construction activities, but for the most part remained idle.

. . .

[15072] Q. I understand that with respect to the other items in the K schedules the entries were made during the



time that the Pennsylvania system of accounts was in existence; is that right? A. I believe that is correct.

Q. Did you determine that the Pennsylvania Water and Power Company was following that 1919 system of accounts during the time these entries were made?

. . .

[15073] THE WITNESS: I believe the company considered itself subject to the system of accounts. The system of accounts had been issued effective January 1, 1919. The company was subject to the jurisdiction of the Pennsylvania Commission so far as I know.

. . .

Q. And at least you proceeded on the theory that they followed that system of accounts? A. That is one of the things that I considered, as I said before.

. . .

[15074] Q. I am not sure I follow you on that. Let me see if I can state my understanding. You have determined that the uniform system of accounts that the company was following during the time it made these Schedule K entries was the system of accounts effective January 1, 1919, prescribed by the Pennsylvania Commission; is that right? A. That is one of the things.

[15075] Q. Did you determine that the entries as made, either to the depreciation reserve or to operating expenses, by the Pennsylvania Water and Power Company were not permitted by that system of accounts prescribed by the Pennsylvania Commission which became effective January 1, 1919? A. From the Pennsylvania system of accounts and general accounting principles it appeared to me that the items in the "K" Schedules have been properly charged to Plant Account.

Q. That is not my question. I want you to confine yourself to the system of accounts prescribed by the Pennsylvania Commission. Let's leave out of our consideration

for the moment the general accounting principles you have referred to.

So confining yourself, did you determine that the entries made either to the depreciation reserve or operating expenses were erroneous under the provisions of the Pennsylvania System of Accounts?

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[15076] A. As to my portion of the determination, that is what the system of accounts of the Pennsylvania Commission indicated to me.

Q. All right. Now, then, what provision in that system of accounts indicated to you that Item Number 1 was erroneously charged to the reserve for depreciation which appears on page 35 of Exhibit 320? A. Page 43 of the Uniform Classification of Accounts for Electric Companies prescribed by the Public Service Commission of the Commonwealth of Pennsylvania, effective January 1, 1919, contains this language at page 43 under the heading of "Fixed capital accounts installed since December 31, 1918—Definitions and Instructions."

Under the subdivision of fixed capital there is the following language: "Betterments are physical changes in [15077] structures or equipment, the object of which is to make the structures or equipment affected more useful or of greater capacity than they were at the time of their original installation or acquisition. The utility shall charge as a betterment to the appropriate subaccount of '101—Fixed Capital Installed Since December 31, 1918' account that portion of the cost of such changes as will, when added to the original cost of structures or equipment bettered, give the cost of the structures or equipment in their bettered condition."

Q. Now, then, you concluded that that provision made the charge to the reserve for depreciation of Item Number 1 on page 35 of Exhibit 320 an accounting error? A. That was one of the things. Of course, there was also the

present FPC system of accounts, and the fact that we were required to determine original cost at a subsequent date.

Q. I am dealing with the provisions of Electric Plant Accounts Instruction 2-B right now.

Did you understand that the management had the discretion of determining what represented a betterment?

A. I don't understand what you mean by "discretion."

Q. Wasn't it up to management to decide whether it was a betterment or not? A. It was up to whoever was going to indicate the proper charge to the account.

[15078] Q. The company was to decide whether it represented a betterment. Right? A. That is right. Someone in the company.

Q. At the time this entry was made was it determined that it was a betterment? A. Apparently not, or it would have been so charged. Apparently no such determination was made at that time. What actually happened at the time of the entry I don't know. I wasn't there.

Q. This summary of betterments as you have classified them represents a present determination that they were betterments? Isn't that so? A. A determination in 1938-39 as required by the Federal Power Commission.

Q. Now, then, do I understand from your last statement that it has been determined that these items were betterments within the meaning of the Federal Power Commission System of Accounts which became effective January 1, 1937? Is that it? A. That is another one of the things we considered.

Q. Well, was that the basis for determining that they were betterments, the standards set up in the Federal Power Commission's System of Accounts which became effective January 1, 1937? A. There was no one thing, Mr. Goldberg. I think I previously said we considered all of these things. I did [15079] for my part, and then Mr. Gunn and counsel made the final decision to include the items. As far as my part in it is concerned, they appeared to be betterments to me in accordance with all of these various meas-



ures we had to make, which were the Pennsylvania System of Accounts, the Federal Power System of Accounts, and accounting principles as I understood them.

Q. Did you determine that it was a betterment under the Pennsylvania System of Accounts as it existed in 1923?

A. It appeared to me that these items were betterments under the Pennsylvania System of Accounts, the Federal Power System of Accounts and Accounting Principles as I understand them.

Q. Did you determine whether the management or the company at the time the entries were made considered them betterments? A. No, I made no determination as to what took place at the time the entry was made.

Q. And that applies, does it not, to Items 2 and 3 appearing on page 34 of Schedule "K"? A. Yes, I think that applies to Items 2 and 3.

Q. Is it your testimony that under the Pennsylvania System of Accounts, which was effective January 1919 that an expenditure determined by the management at that time as representing a betterment could be accounted for only by a charge to subaccount "101—Fixed Capital Installed Since [15080] December 31, 1918"?

THE WITNESS: I believe that an item which was a betterment under the Pennsylvania System of Accounts should be charged, or should have been charged, to Utility Plant.

By MR. GOLDBERG:

Q. Otherwise it was in error? A. That is right.

Q. From 1923 to 1935, did Pennsylvania Water and Power Company have its balance sheets and income statements certified by public accountants? A. Yes, I am sure they had.

Q. Do you recall whether at any time they took exception to the accounting as not being in accordance with the principles of accounting which the company had to follow? A. No, I don't recall they ever took exception, but on the



other hand I don't recall that their analysis of the company's accounts went that far into the plant accounting.

. . .

[15087] Q. Isn't this the fact: That whether it is a betterment or a replacement under those definitions as they appear in the Pennsylvania System of Accounts, and which are now in the record, it is a matter of judgment which may vary with the individuals making the determination? A. I would say that is so.

Q. In other words, there is no clear line of demarcation as to what is a replacement and what is a betterment? Right? A. I believe it would depend in part on judgment, yes.

Q. And two people acting in entirely good faith could reach different conclusions on the same facts as to whether it was a betterment or a replacement. Right? A. I believe that would be possible.

. . .

[15088] Q. Did you determine whether these items that you have referred to as betterments, additions or replacements had been individualized on the books of the company? A. Based upon the information I had from Mr. Wetzel, it was my opinion, along with the others, that these items were properly betterments, replacements or additions in accordance with the System of Accounts.

Q. Does System of Accounts mean Pennsylvania? A. Pennsylvania, FPC System of Accounts, and also my general accounting knowledge. Everything was considered.

. . .

[15089] Q. Isn't it a fact that in connection with a reading of the accounting for betterments and replacements, as [15090] reflected on page 43 of the Pennsylvania System of Accounts, you must consider the paragraph appearing on page 37 of the System of Accounts which I read into the record?

. . .

THE WITNESS: I think it is necessary to consider the entire system of accounts in connection with any particular section.

By MR. GOLDBERG:

Q. Because, while page 43 may appear to provide no discretion in the management with respect to the accounting, the provision on page 37 may provide that discretion if there is no satisfactory individualization of the structures and equipment. Isn't that so?

THE WITNESS: I think you have to consider both in conjunction with the entire system of accounts, but I would like to point this out as long as we are talking about that in this connection. It states, on page 43 of the Pennsylvania System of Accounts, "The Utility shall charge as a betterment."

That indicates to me that it should be done.

[15091] By MR. GOLDBERG:

Q. Yes. A. It should be so charged as a betterment.

Q. When it is a betterment? A. That is right.

Q. Yes. A. And based upon the data obtained from Mr. Wetzel in my opinion these are betterments. Therefore I think they are proper.

[15094] Q. Why did you include pages 51, 52 and 53 in Exhibit 320? A. As additional explanatory material of the item of \$1400 for the Holtwood Church.

Q. Did you decide to include them or did Mr. Gunn ask you to include these in the same way he asked you to include page 18? A. No, I decided to include those as being explanatory. In Mr. Gunn's testimony I believe he refers to the letter shown as page 51 at transcript 8332, and that letter was followed by the letter which appears as page 52.

Page 53, I obtained from a book entitled "The Constitution of the Presbyterian Church in the U. S. A.," and

it appeared to me that that was the section which must have been the basis for the church not accepting the offer of the company.

Q. When was that constitution adopted? A. Well, I was unable to determine the exact date because it was for the period from 1805 to 1939, and the only copy I had available was a 1939 copy.

Q. Do you know whether the company's contribution was used for the building or for the furnishings in the building? A. I don't know exactly, but I believe it was used for the building, because that was the first thing which had [15095] to be gotten. You had to have a building before you could put the furnishings in. I don't think the furnishings cost as much as \$1400 originally.

Q. The \$1400, however, had nothing to do with the land; is that right? A. That is right. That had nothing to do with the land. The land always has been owned by the company and the church building is located on the land which is owned by the company.

[15101] MR. KING: \* \* \* I also would like to state that transcript page 14,577 shows Your Honor stating as follows:

"As I understand it, Respondents' counsel is not withholding any witness who is necessary to substantiate any fact appearing in Exhibit 320 for identification. Isn't that correct?

"MR. KING: That is correct, Mr. Examiner."

In view of that statement I would like to have the record show that Mr. Wetzel has been in the hearing room all during the cross-examination of Mr. Eichhorn and that we tender Mr. Wetzel and Mr. Bortner, whom we can make available [15102] in a very short while, for cross-examination if Mr. Goldberg so desires.

[15107] **CARL WILLIAM WATCHORN,**

was called as a witness on behalf of Pennsylvania Water and Power Company, and, having been first duly sworn, was examined and testified as follows:

**DIRECT EXAMINATION.**

**By MR. SPARKS:**

Q. Please state your full name, Mr. Watchorn.      A.  
Carl William Watchorn.

Q. By whom are you employed?      A. The Pennsylvania Water and Power Company.

Q. Will you state your educational qualifications, membership in technical and scientific societies, and technical experience prior to your employment with the Pennsylvania Water and Power Company?

. . .

[15113] **THE WITNESS:** I was graduated from the Worcester Polytechnic Institute with the degree of Bachelor of Science in Electrical Engineering in 1923 and was granted the professional degree of Electrical Engineer in 1936 by the same school.

I am a member of the Honorary Engineering and Scientific Societies of Tau Beta Pi and Sigma Xi, respectively, an Associate Member of the American Institute of Electrical Engineers, a member of a sub-committee of the Hydraulic Power Committee of the Edison Electric Institute for the purpose of collecting forced outage data of hydro-electric units, and a Registered Professional Engineer in the State of Maryland.

I was employed in the Test Department of the General Electric Company, on electrical machinery and equipment tests, for about 15 months in 1921 and 1922; and in the Test Department of the then The New York Edison Company, now the Consolidated Edison Company of New York, Inc., for about 10 months in 1923 and 1924. I accepted employment with the Pennsylvania Water & Power Com-



pany in 1924 and have been continuously employed with that company to date.

By MR. SPARKS:

Q. What has been the nature of your employment with the Pennsylvania Water & Power Company? A. I was employed in the Company's test department [15114] for about 2 to 3 years and then as a special assistant to the Superintendent of the Company's steam plant at Holtwood for about a year. During this period I was also assigned to special studies of various kinds in the Company's Baltimore Office for various lengths of time. In 1928 I was assigned to the Company's Baltimore Office as an assistant to the Efficiency Engineer and Assistant General Superintendent, the latter of whom was later promoted to General Superintendent.

Q. Was the Assistant General Superintendent and later General Superintendent, to whom you referred in your last answer, Mr. R. L. Thomas, now Vice-President of the Consolidated Gas Electric Light and Power Company of Baltimore? A. Yes.

Q. The same Mr. Thomas who has already testified in this case? A. Yes.

Q. How long did you hold the position of assistant to Mr. Thomas? A. Until 1938.

Q. What were your duties during that period from 1928 to 1938? A. My duties during that period were quite varied from time to time, depending in large measure on what problems of the Company commanded particular attention. A great deal of my time was devoted to load and capacity studies.

[15115] Q. What position do you now hold with the Company? A. My present position is that of Efficiency Engineer.

Q. How long have you held that position? A. Since 1938.

Q. Are your duties confined to the operations of Penn Water? A. No.

Q. To what other company or companies do your duties extend? A. The Safe Harbor Water Power Corporation.

Q. Are your duties with respect to Safe Harbor any different from those with respect to Penn Water, at least to the extent that the operations of these two companies are similar? A. No.

Q. What are these duties of your present position? A. Again, they are varied, but primarily they are the general supervision of the efficiency of operation of the power generating facilities at the plants of the companies in conjunction with the maximum overall economical utilization of such power generation and facilities on the interconnected systems insofar as Penn Water and Safe Harbor are concerned.

Q. Do your present duties still include the making of load and capacity studies? [15116] A. Yes, they do.

Q. Have you ever presented any technical papers? A. Yes, several.

Q. Have any of these papers ever been published? A. Yes, one, I believe, to which I was co-author with Mr. H. A. Von Eiff.

. . . . .

[15118] Q. Do the Holtwood and Safe Harbor hydro plants have sufficient storage for use over periods of longer than a few hours? A. Yes.

Q. Would you say that these plants are run-of-river plants within the definition of Instruction 4 of Schedule 2, F. P. C. Form 12? A. Definitely not. The storage at the Holtwood plant, when considered by itself, is more than sufficient to operate the entire installed capacity in the peak of the interconnected system load with refill of the storage by the beginning of the following week, even with the most adverse low river flows. However, if we consider the Safe Harbor plant alone or the Holtwood and Safe Harbor plants combined, using the storage in the Safe Harbor pond alone, such storage is sufficient to limit or regulate the

system annual maximum required steam generation over periods of several weeks.

•   •   •

[15135] Q. It appears from your prior testimony that you have been working on various aspects of the application of the theory of probability to the problem of system generating capacity requirements for quite some years. When did you first start working on this general problem? A. I initiated the present line of investigation of this general problem in our company in the spring of 1936; that is eleven years ago now.

Q. That was during the period that you reported to Mr. R. L. Thomas, was it not? A. Yes.

Q. How long did you continue to report to Mr. Thomas after you started this work? A. Two more years, until the spring of 1938, when he accepted a position with Baltimore Company.

Q. Was he interested in this work? A. Yes. He was also very encouraging and in addition made available extra help to carry on the necessary investigations.

Q. Do you know if he ever used any of the results of [15136] your work? A. Yes.

Q. Had you been able as of that time to develop your method of making these studies to the comprehensive degree that you can make such studies as of the present time? A. No.

Q. Please explain. A. This line of investigation was in a formative stage up to about three years ago, although we were able to obtain fairly good results during that period. Our thoughts as to this matter did not really become crystallized until about three years ago. Our later work has largely been the development of specific details of application of the general method. We can now reasonably take into account all the pertinent factors in a practicable and expeditious manner.

Q. Did you have any responsibility in connection with the determination of the figures for dependable hydro

capacity appearing in the F. P. C. Form 12 Reports for the years 1944 and 1945 as filed by Penn Water on behalf of the Holtwood-Safe Harbor system? A. Yes.

Q. Were the determinations of such figures for dependable hydro capacity in those reports based upon your studies that you have outlined up to this point? [15137]

A. Only with respect to the figures in the 1945 report.

Q. Do I understand that the figures in the 1944 report were not based upon such studies? A. No, they were not.

Q. Why were they not? A. Because the method of making such studies had not been sufficiently developed until about the middle or latter part of 1945.

Q. Have you examined the figures shown by Mr. Davis in his Exhibit 64 for dependable hydro capacity of the combined Holtwood-Safe Harbor hydroelectric developments and his allocation of such dependable capacities as between the two developments? A. Yes, I have.

Q. Do you agree with his conclusions with respect to the dependable hydro capacity of the combined Holtwood-Safe Harbor hydroelectric developments and his allocations of such capacity between these two developments? A. No, I do not.

Q. Have you examined the figures given by Mr. Thomas in his testimony on dependable hydro capacity of the combined Holtwood-Safe Harbor hydroelectric development? A. Yes, I have.

Q. Do you agree with his conclusions with respect to the dependable hydro capacity of the combined Holtwood-Safe [15138] Harbor hydroelectric developments? A. No, I do not.

Q. Will you now describe as briefly as possible the general method that you have developed for making such studies of the generating capacity requirements on any electric generating system and for the purpose of determining the dependable hydro capacity figures found in Schedule 16 of the 1945 F. P. C. Form 12 Report? A. I



used two basic propositions or principles of the theory of probability, (1) that the probability that two or more independent events will happen or exist as of the same time is the product of the probabilities that each of the separate events will happen or exist as of that time and (2) that when an event can happen or exist in more than one way, the probability that it will happen or exist is the sum of the separate probabilities of its happening or existing in each of these separate ways. These two simple propositions are all that we need to know, by way of basic principles, relating to the theory of probability in order to develop our process of statistically analyzing the capacity situation on any electric generating system.

. . .

[15149] Q. Are there any other reasons why steam or hydro units or capacity may be unavailable other than as a result of forced outage? A. Yes.

Q. Will you please explain? A. There are further reductions in the load carrying [15150] capability of steam capacity because of changes in condenser circulating water temperature for the various seasons of the year and reductions imposed by limitations of tie cables. There are reductions in the load carrying capability of hydro capacity because of variations in river flow and available head; and then of both hydro and steam capacity because of scheduled maintenance.

Q. Are these factors taken into account in your study in addition to the unavailability of steam capacity because of forced outages and routine maintenance previously described by you? A. Yes.

. . .

[15153] Q. How did you treat the Holtwood and Safe Harbor storage in these studies? A. I conservatively assumed that no Holtwood storage would be used other than that required for normal operation of weekly refill. The Safe Harbor storage was also conservatively used to the

extent that the available physical capacity of the hydro plants, taking the scheduled maintenance into account, was not smaller than the required hydro capacity or the draw-down was limited to a minimum elevation of 215.0, with only partial refill by the beginning of the following week.

Q. Did you mean that such use of the available Safe Harbor storage as you have just described is conservative as well as assuming no use of the Holtwood storage? A. Yes, I did. This can be shown to be a fact.

. . .

[15162] Q. Do these two curves shown on Exhibit 329 enable you to make your determination of dependable hydro capacity? A. Yes, they do.

Q. Will you tell us how you do this? A. A comparison of these two curves shows that, for all practical purposes, over the whole range of 15-minute annual peak loads for which these curves are shown from 1,025,000 kilowatts to 1,125,000 kilowatts, and also for [15163] the whole range of overall system reliability of failure to carry the load from the corresponding average rates of one day in 400 years, which is a somewhat greater degree of reliability than is reasonable or desirable, to one day in 1.5 years, which is a considerably smaller degree of reliability than is reasonable or desirable, the system hydro plants are equivalent to or replace, capacity-wise, 285,000 kilowatts of installed dependable steam capacity made up of five 57,000 kilowatt units.

. . .

[15164] Q. Does your previous answer mean that the dependable capacity of the system hydro plants on the load of the interconnected system is 285,000 kilowatts? A. Yes, it does.

Q. What, in your opinion, is a satisfactory and desirable degree of overall system reliability of generating capacity? A. A chance of failure to carry the system load at the average rate of one day in 25 to 30 years as a minimum to one day in about 100 years as a maximum. As

shown by Exhibit 329, this range of reliability permits a range of annual peak load of about 20,000 kilowatts to 25,000 kilowatts with a corresponding range in the magnitude of system reserve.

Q. Does the load that you use in your determination of dependable hydro capacity have any effect on such determination? A. Yes.

Q. Will you please explain? A. On the conservative basis that I used, low flow periods were the predominant factor in my determination of dependable hydro capacity. The result of this is that the [15165] shape of the system load, whether it is sharp, that is, whether it has a large excess of the weekly peak load over the weekly sustained load, or whether it is flat, that is, whether it has a small excess over the weekly sustained load, is an important factor in the amount determined as dependable hydro capacity.

Q. In what way do these load characteristics affect your determination of dependable hydro capacity? A. The sharper load shapes result in the determination of larger amounts for the dependable hydro capacity and the flatter load shapes result in the determination of smaller amounts.

Q. Do these changes in load shape have a direct or a proportional effect on your determination of dependable hydro capacity? A. A proportional effect.

Q. Have you made a determination of such proportional effect? A. Yes.

Q. What result did you obtain? A. That the dependable hydro capacity is affected by about 55 per cent of the change in the excess of the annual one-hour peak load or of the annual 15-minute peak load over the maximum weekly sustained load.

[15169] Q. I show you Exhibit 331 and ask you did you prepare it? A. Yes, I did.

Q. What does this exhibit show? A. This exhibit shows the probable average rate at which various amounts

of drawdowns may be required, in accordance with our assumption, for one week to prevent failures to carry some part of the system load. It shows that drawdowns of various specific amounts are very infrequent and also shows that drawdowns required to provide load carrying capability in excess of 20,000 kilowatts to 25,000 kilowatts are of very little concern from a practical [15170] point of view. In addition, I wish to call particular attention to the great infrequency of the larger amounts of drawdown, drawdowns of between 55,000 kilowatts and 59,000 kilowatts occurring at the average rate of one week in 1670 years and drawdowns of between 60,000 kilowatts and 64,000 kilowatts occurring at the average rate of one week in 8,000 years.

Q. What is the significance of these results? A. That the probability of failure to carry the load because of shortages of hydro energy available from the natural river flow is very small.

[15190] Q. Have you made a determination of the probability of failure to carry the load because of a shortage of hydro energy from the natural river flow, such that the Safe Harbor storage would be insufficient to prevent such failures to carry the load when there is sufficient steam capacity installed on the system? A. Yes.

Q. What result did you obtain? A. Such failures to carry the load because of a shortage of hydro energy coincident with such forced outages of steam capacity could be expected to occur at the average rate of one week in more than 120,000 years.

Q. Have heavy weekly sustained loads ever occurred during the first week of December? A. Yes.

[15190-A] Q. Did you also make a determination of the probability of failure to carry the load with respect to the first three weeks in December, in the same manner as you just described with respect to the second and third weeks of that month? A. Yes.



Q. What results did you determine for this situation?

A. That such failures to carry the load could be expected to occur at the average rate of one week in more than 95,000 years.

Q. What conclusion do you draw from this analysis?

A. That it is absurd to entertain any but the most remote apprehensions concerning failures to carry the load because of the occurrence of such improbable events.

. . .

[15193] Q. Was there any material difference, in so far as [15194] your determination of dependable hydro capacity is concerned, between the load you used in your study and the load forecasted for future conditions, with Standard Time, as reported in the combined Penn Water or Holtwood and Safe Harbor System F. P. C. Form 12 Report for 1944? A. No.

Q. Was there any difference, in this same regard, between this report and the 1944 F. P. C. Form 12 Pool Report filed by Baltimore Company for the combined Holtwood, Safe Harbor, Baltimore, Bethlehem Steel and Washington Systems? A. No.

Q. Are these the Form 12 Reports referred to by Mr. Davis beginning at line 15 of page 1188 and ending at line 3 of page 1190, with intervening questions, and also referred to beginning at line 7 to line 25 of page 1206? A. Yes.

Q. Do you agree generally with Instructions 5 and 1 (b) to Schedules 2 and 16, respectively, of F. P. C. Form 12, relating to dependable hydro capacity? A. Yes.

Q. Have you evaluated all the factors enumerated therein in your study? A. Yes, in as thorough a manner as I believe it is possible to do so from a practical point of view.

. . .

[15220] Q. I refer you to the sentence beginning at line 14 of page 1189, where Mr. Davis stated, "The excess

available by further use of Safe Harbor storage is computed at 57,000 kilowatts. This additional capacity is used only in case of emergency and obviously is of a different quality from capacity under a weekly recovery program," and ask you do you agree with this statement? A. No, I do not.

Q. Will you please explain? A. In the rare instances when Safe Harbor storage is required it serves the same purpose and use as dependable steam capacity in comparable cases of emergencies on all-steam systems, and, consequently, is nonetheless dependable hydro capacity replacing the full amount of dependable steam [15221] capacity that otherwise would perform the same service. And further, this additional capacity, which Mr. Davis says depends on drawdown, and more is actually available and used nearly all the time, thereby permitting steam capacity to be on standby for use in case of emergencies and in addition performs the useful functions of facilitating maintenance of steam units, for which purpose, additional dependable steam capacity might otherwise be required to be installed.

. . .

[15222] Q. Did you make any provisions in the load you used in your detailed study of dependable hydro capacity for the change brought about by the discontinuance of the supply to Edison Light and Power Company of York and the beginning of the supply to Metropolitan Edison Company? A. No, I did not, and I have not considered this change in any of my testimony thus far.

Q. Did you take this factor into consideration in your final determination of dependable hydro capacity? A. Yes.

[15223] Q. Will you please explain how you did this? A. As of last year, we have some recent Metropolitan Edison Company load data, which I studied and concluded that, based on such data, the dependable hydro capacity would

be increased 10,000 kw. as a result of the inclusion of this load with that of our interconnected system.

Q. What then was your final determination of the dependable hydro capacity for the year 1946? A. 295,000 kw.

Q. What was your actual experience in 1946 with respect to the effect of the supply to Metropolitan Edison Company? A. The actual experience was that the dependable hydro capacity would be increased about 20,000 kw. as the result of such supply rather than the 10,000 kw. previously estimated.

. . .

[15224] Q. Did you use any coordination with the companies in Area 5 in your determination of dependable hydro capacity? A. Only with respect to the supply to Metropolitan Edison Company in the same manner as for our supply to Baltimore Company in connection with which we coordinate our hydro operations with the steam operations of Baltimore and Washington Companies.

Q. To how much capacity benefit did this amount? A. About 5,000 kw.

Q. Is there any additional potential capacity benefit available from your using coordinated operation with the other companies in Area 5 in your determination of dependable hydro capacity? A. Yes.

Q. Can you tell us how much more? A. I don't know exactly. Our latter studies during the war showed an additional capacity benefit from coordinated operation with all the companies in Area 5 of 20,000 kw. available in Area 6 from backfeed energy alone from Area 5. I do not know to what extent changes in load shapes in Area 5 since the war, may have changed this quantity. I would, however, expect that any changes would tend to increase such benefits, and at least not adversely affect them. If [15225] this is true, then there would be additional capacity benefits available from coordinated operation with the companies

in Area 5, other than Metropolitan Edison Company, of about 15,000 kw.

Q. It is true then, is it not, that to the extent there are available such benefits, your determination of dependable hydro capacity is that much more conservative than previously stated by you? A. Yes.

Q. Are you able to state, in your opinion and to the best of your knowledge and belief, that your determination of dependable hydro capacity for "run-of-river" hydro plants is the most comprehensive and thorough that has ever been made? A. Yes, it is.

Q. Beginning at page 1190 of the record, Mr. Davis testified that dependable capacities at the two hydroelectric plants, viz: at Holtwood and at Safe Harbor, bear the same ratio as their respective installed capacities. Is such a fact? A. No, it is not.

Q. Do you normally make separate determinations of the dependable hydro capacity of the Holtwood hydro plant of Penn Water? A. No. There has never been any occasion to do so.

[15226] Q. Have you made such a determination? A. Yes.

Q. What amount did you determine as the dependable capacity of the Holtwood hydro plant? A. 100,000 kw.

Q. What is your basis for this determination? A. My intimate knowledge of the Holtwood and Safe Harbor hydro plants together with my experience as to these matters.

Q. What factors did you consider in this determination? A. There are two engineering approaches to this problem. The first is what might be called the "historical" approach, which would take into account the fact that Holtwood antedates Safe Harbor by many years and that the dependable capacity of the Safe Harbor plant would be that amount which would be used to justify its installation as of the time such determinations were made. This approach would result in a dependable hydro capacity for the



Holtwood hydro plant of slightly less than the full installed capacity and would be about 100,000 kw. The second is what might be called the "present situation" approach, on which basis the load carrying capability of each of the Holtwood and Safe Harbor plants would be based on consideration of the energy available at each of the plants for various river [15227] flow conditions. This approach would also result in a dependable hydro capacity for the Holtwood hydro plant of about 100,000 kw.

. . .

[15235] Q. Is your determination of dependable hydro capacity a mathematical and scientific determination? A. Yes, it is, on a very conservative basis.

. . .

[15322]

HERBERT B. DORAU.

. . .

CROSS-EXAMINATION (Resumed).

By MR. GOLDBERG:

. . .

[15429] Q. Do you attach any significance to the fact that the depreciation reserve balance appears on the right side of the balance sheet? A. Yes, I think it is significantly indicative of the fact that it means to indicate or is taken to indicate that there was that much of a reservation of revenue against some future date when the liability to retire has matured.

Q. I see. Now, showing you the Federal Power Commission's system of accounts, and more specifically the set-up of the balance sheet which appears on pages 16 and 17, is the reserve for depreciation shown as a liability? A. Yes, it is on the liability side of the balance sheet.

Q. Isn't the balance sheet on that side called "Liabilities and Other Credits"? A. Yes, that longer form is sometimes used.

Q. Now, do you take the section of the right side of the balance sheet which is entitled "Reserves" to fall within the phrase "other credits" or the word "liabilities"? A. I have never made the distinction.

Q. You never made a distinction between liabilities and other credits when you thought about the reserve for depreciation? A. No, I also treat them as liabilities.

. . .

[15340] Q. Well, do you, or do you not agree that they can be used to retire bonds? A. No, other assets may be employed to retire bonds.

Q. In other words, you are saying that the assets reflecting the depreciation reserve balance are not available for general corporate purposes? A. Those assets to the amount of the depreciation reserve balance are retained in the business.

[15341] Q. Does that mean that you are saying that the assets reflecting the depreciation reserve balance are not available for general corporate purposes? A. Those particular assets, if tagged and identified, would not be available for that purpose.

That is not my position in this matter. That is your assumption.

Q. Are you saying that if they had not been tagged, they may be used to retire bonds? A. No, the bonds would be presumably retired out of liquid assets available to the enterprise.

Q. Let us assume that the assets reflecting the depreciation reserve balance are invested in an electro-alloys company. When so invested, are they devoted to the public service? This is an electric utility that uses the assets reflecting the depreciation reserve balance? A. Their public service consists of their being retained in the enterprise and available as a basis of credit to finance the replacement. Their particular investment as such is, of course, not a public utility investment, I presume.

Q. But you would say that the assets are to be considered, though invested in the electro-alloys company as devoted to the public service of the electric consumers? A. Assets to that amount are retained in the business to reflect the depreciation reserve balance.

[15342] Q. Your answer is yes to my question? A. Yes.

Q. Do I understand your testimony at 14,730 that electric plant held for future use is to be included in the rate base? A. Yes, I understand that electric plant necessarily held for future use is properly in the rate base. It should be.

Q. Now, you have tried to draw an analogy between the reserve assets, and working capital. Do you recall that?

A. A very general comparison, yes.

Q. However, you consider it a proper analogy, don't you? A. Yes, I used it.

Q. Is working capital provided to meet some future liability? A. Yes, that is a very short-term cycle of liability to employ.

Q. Where capital is provided to meet current expenses? A. For the cycles within the year, even?

Q. Within the year or within the month? A. It might even be within the month.

[15347] Q. How about the statement that depreciation reserve is an account contra to the plant account? A. It seems to me that is a bookkeeping observation.

Q. Do you agree with it? A. I presume that is the way they state it but I do not know what it means.

Q. Well, you testified on direct that it was not merely or simply a contra account. A. Well, all right.

Q. Now, then, is it a contra account at all? A. It seems to me it might be contra to other assets.

Q. What other assets? [15348] A. Other assets reflecting the depreciation reserve balance.

Q. Are you saying that the depreciation reserve balance may be a contra account to other assets? A. Yes.

Q. Such as? A. Cash, investments in bonds or securities.

Q. In other words, you are saying you do not agree it is a contra account only to plant account? A. I do not see that it is necessarily that, no.

Q. Now, is it a contra account at all? A. In the sense of being opposite liability, contra to assets, of course.

[15350] Q. I want to direct your attention to certain questions and answers in the Safe Harbor record when you were on cross-examination in that case, referring to transcript page 4840, line 20, and I will read beginning at line 20 through line 8 on page 4841 to simplify it.

“Question: Now, is it your contention that the purpose of depreciation charges is to provide for replacements of property?”

[15351] “Answer: I can’t follow that.

“Question: Is it—

“Answer: Therefore—since a retirement is not necessarily accompanied by a replacement the purpose ends with the final accumulation of an amount equal to the cost of the unit of property and the clearing of those accounts by charging the retirement to the reserve.

“Question: It has nothing to do with the replacement of property?”

“Answer: It does not necessarily have anything to do with it. But the fund generated may be employed as any other fund may be employed.”

I have correctly read the transcript in the Safe Harbor case? A. Yes.

Q. And you so testified, did you not? A. I did.

Q. Do you still agree with those statements there made? A. Yes, I think I agree with those statements.

Q. May I refer you to transcript 4876 of the Safe Harbor case, when you were on cross-examination.



This question was asked you at 4876:

“Question: Now, these assets contributed by the ratepayers may be used to liquidate liability or retire [15352] bonds; isn't that so?”

And you answered, “Any assets which the company may have can be employed for any legal purpose.”

That question and answer appear, do they not? A. Yes.

Q. And you so testified in that proceeding? A. Yes.

. . .

[15354]

RE-DIRECT EXAMINATION.

By MR. HULL:

Q. Dr. Dorau, a few moments ago your attention was directed to certain of your testimony in the Safe Harbor case relating to assets generated as a result of depreciation reserve charges, and their use “for any corporate purpose”. Did you intend by your answers in that case and in this case on the same subject to imply that assets generated as a result of depreciation charges can be used to pay dividends to stockholders without the substitution of other assets of equivalent value in place of the assets used in paying the dividends?

MR. GOLDBERG: I object to the question as leading. It puts the answer in the witness' mouth.

TRIAL EXAMINER: The objection is overruled.

THE WITNESS: No, I construed or I assumed by virtue of the context of the discussion that any corporate purpose referred to an employment of those assets in the enterprise. I never assumed that they could be paid out in dividends. I had in mind any appropriate employment of those assets by the enterprise.

[15355] By MR. HULL:

Q. Now, this morning or early this afternoon reference was made by Mr. Goldberg to the possibility of accounting

for depreciation reservation on the left-hand side of the balance sheet as a deduction from plant account. If that method of accounting were adopted, would that mean that the assets reflected by the depreciation reservation would not have to be retained in the business? A. Not at all.

Q. So that the retention would be necessary no matter which side of the balance sheet the reservation was recorded? A. Yes.

Q. Now, I direct your attention to transcript pages 14,992, beginning at line 15 and extending over to 14,994, line 16.

MR. GOLDBERG: Where was the beginning point, 14,982?

MR. HULL: 992, line 15.

MR. GOLDBERG: Did you end with line 17?

MR. HULL: 16.

MR. GOLDBERG: Line 16 ends with a question and that is why I wondered whether you intended to go to line 17.

MR. HULL: Yes, line 17.

THE WITNESS: I have just glanced over that.

By MR. HULL:

Q. You are now familiar with the subject that was being [15356] talked about? A. Yes.

Q. Now, prior to that portion of the transcript, and beginning at transcript page 14,968, line 21 you will recall that Mr. Goldberg asked you to assume that a transmission line were to be built at a cost of \$500,000 which had a 40-year service life, and at transcript 14,990, line 22, he asked you to assume that the service life of that line had expired, that the line had been retired, and the company had \$500,000 of assets reflected by the depreciation reserve balance.

Then at transcript page 14,993, line 23, he asked you this question:

"If replacement of the property is not to take place, is there any necessity in your opinion for the maintenance of the so-called fund?"

And by the "fund" he referred to the \$500,000 of assets generated by charges for depreciation.

MR. GOLDBERG: Just a minute. You have not finished your question?

MR. HULL: No.

MR. GOLDBERG: I will wait until you finish.

By MR. HULL:

Q. —and corresponding reservations of revenue. To this you replied that under such circumstances it would not be necessary to retain those assets in order to provide for [15357] the replacement of the property retired.

Now, with that background, let us assume that under those circumstances, a regulatory body having jurisdiction had found that the \$500,000 was not needed in the business to insure continuity of service, and assume also that the utility had no debts to pay off.

What other use could the utility make of those assets of \$500,000?

MR. GOLDBERG: May I have the question from the very beginning?

TRIAL EXAMINER: Yes, read the question.

(Record read.)

THE WITNESS: They could invest then in non-utility property, presumably, under the assumptions.

By MR. HULL:

Q. Under those assumptions, the retention in the business would not be required, would it? A. Not for the purposes that we have assumed.

Q. Would it be possible under those circumstances to reduce the capital stock and pay a liquidating dividend to

the stockholders? A. If the law and regulatory authority allowed it.

Q. And assuming the regulatory body having jurisdiction found that these assets were not necessary in the business and might be paid or returned to the stockholders, then that [15358] could be done? A. Yes, that is my understanding if the law permits it, it could be done.

Q. Now, I want to refer you to transcript page 14,838. At transcript page 14,838, Mr. Goldberg had marked for identification Exhibit 322, a copy of which I hand you, and at transcript page 14,839 in the question, lines 13 to 16, he indicated that Exhibit 322 was based on actual investment, depreciation, and actual earnings for the years 1911 to 1945.

Then on the following page, transcript 14,840 at lines 19 to 20, he intimated that you had made that kind of a study in the Safe Harbor case, that is, one based upon the actual earnings from the initiation of the project to the time of the hearing, and he called your attention to Table 4 particularly of your Exhibit 53 in the Safe Harbor case.

Now, I ask you whether or not in your Exhibit 53 you did in fact make use of the actual investment, actual depreciation and actual earnings for the years 1933 to 1944, which were the years involved in the Safe Harbor case?

MR. GOLDBERG: That is based on your interpretation that I was relating my question to actual earnings and their use by the witness for that purpose.

MR. HULL: Yes.

MR. GOLDBERG: All right.

THE WITNESS: Well, if I left that impression at 14,840, [15359] I was in error, because I did not apply the actual earnings of the past period in my analysis.

I will direct your attention to line 21 of 14,840 which probably is not too clear, where I said, "Yes, I didn't, you did".



I thought that had clarified the matter, namely, that I had not done that but Mr. Goldberg's tabulation helped on that.

By MR. HULL:

Q. Do you recall, also, Doctor, that in that case, after Exhibit 53 had gone in Mr. Goldberg presented you with Exhibits 172 and 173, which were based on actual earnings, and then subsequently Respondents prepared Exhibits 191 and 192 which were basically the same calculations that you have made in Exhibit 53, but which used a five and a half per cent rate of return instead of the 7 per cent used in Exhibit 53? A. I have a general recollection of that fact.

MR. GOLDBERG: May I have that question, please?

There were a lot of exhibits in there.

TRIAL EXAMINER: Yes.

(Question read.)

By MR. HULL:

Q. Now, am I correct in this that you did not in any of your exhibits in the Safe Harbor case base your calculations partly upon actual earnings and partly upon assumed or theoretical earnings? A. I think that is correct. To the best of my [15360] recollection I was content both in the preparation of the exhibits in the Safe Harbor case and in this case.

Q. Now, I would like to direct your attention to your testimony on April 22, which covers a number of pages. I believe it begins about transcript 14,781 and Mr. Goldberg asked you to assume that Pennsylvania Water and Power Co. had on January 1, 1946 bought its plant with an original cost of \$33,540,738 in the electric plant account; that the purchase had been made at that figure less the depreciation reserve and that it was entirely financed by capital

stock, the capital stock being \$23,545,830 and the depreciation reserve being \$9,994,908 so that both sides on the balance sheet showed a total of \$33,540,738.

Now, am I correct that if those assumptions are made by the purchase of the property at the depreciated original cost of \$23,545,830, the purchasing company assumed the liability represented by the depreciation reserve balance?

A. Yes, I so assumed.

Q. And assuming that purchase to be made, and the company to proceed with its operations, as the liability represented by the \$9,994,908 was realized from time to time, how would it have to be met? A. From other assets of the enterprise.

Q. And whose responsibility would it be to raise any additional capital? [15361] A. Management acting for the ownership of the enterprise.

Q. Now, I direct your attention to that portion of your testimony on April 23, in the afternoon, which begins, I believe, at transcript 14,900.

MR. HULL: Mr. Goldberg, do you have any objection to letting the witness see the figures you had him write down?

MR. GOLDBERG: No.

By MR. HULL:

Q. In that portion of the testimony, Doctor, you will recall he asked you to tabulate the results of the straight-line and 3 per cent sinking fund method as applied to Penn Water property, and he asked you to assume, subject to your check, a cumulative investment of \$2,966,537,250; a depreciation reserve of \$1,055,792,807, the difference being \$1,910,744,443.

A return of 5 per cent on that would produce a cumulative return of \$95,537,222. Depreciation expense cumulated would be \$40,367,190.

The total of the return and depreciation expense, according to the straight-line method would be \$135,904,412.

Now, the calculations for the 3 per cent sinking fund would be the same cumulative investment, to-wit, \$2,966,537,250.

The return on that undepreciated rate base at 5 per cent he asked you to assume, subject to your check, to be \$148,326,862 [15362] and the cumulative depreciation annuity would be \$16,194,092.

The total of the last two amounts, that is the return and the depreciation annuity would be \$164,520,954.

So, from that total of return and depreciation annuity he asked you to subtract the straight-line total of return and depreciation expense of \$135,904,412, and derive a figure of \$28,616,542.

Now, after presenting those figures to you, you called attention to the fact that the sinking fund calculation as made by Mr. Goldberg apparently did not take account of the three per cent credit.

Leaving that objection aside, will you tell us what other element enters into it that accounts for an apparently larger charge for return and depreciation under the sinking fund method than under the straight-line method? A. I think the balance of the difference, after appropriate adjustment for the 3 per cent interest component was made, would be accounted for by the difference between 3 per cent and the rate of return which the investor had earned on the additional assets reflected by the depreciation reserve balance and which under the deduction procedure is in effect, credited to the consumer.

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[15443]

WILLIAM F. UHL.

DIRECT EXAMINATION.

. . .

[15446] By MR. KING:

Q. Mr. Uhl, you have previously been sworn as a witness in this case. Is that correct? A. I have.

Q. And you have previously testified in this proceeding as to your qualifications and experience in general. Is that correct? A. That is right.

Q. What experience have you had in the valuations of water rights, riparian lands and developed waterpower for purposes of purchase or sale?

. . .

[15447] THE WITNESS: I have been connected with the purchase or sale of a number of developed and undeveloped water power properties.

In many of these transactions I fixed the price for which the property was purchased or sold. In other cases I advised either the purchaser or seller in arriving at the price at which the sale was made and in at least one case I acted for both parties.

1. Clark's Rip on the Androscoggin River about four miles above Lewiston, Maine. Assisted the purchaser, the Union Water Power Company, in the determination of the purchase [15448] price of the riparian lands suitable for the development of Clark's Rips in 1909. Purchased from the International Paper Company.

2. In 1924 the Clark's Rips water rights were sold to the Central Maine Power Company and I assisted the seller, the Union Water Power Company, in arriving at an agreement with the U. S. Treasury, Internal Revenue Department, as to the value of the riparian lands as of 1913, for the purpose of fixing the taxable profit on the 1924 sale.

3. Clarks Falls, Great Falls, and Woods Falls on the Lamoille River at and near Milton, Vermont. In 1926 I as-



sisted the purchaser, the Public Electric Light Company at St. Albans, Vermont, in the determination of the purchase price on these three undeveloped water power sites on the Lamoille River.

4. In 1936 I placed a value on the developed water powers on the Merrimack River at Manchester, New Hampshire, for the purpose of sale by the Trustees of the Amoskeag Manufacturing Company to the New Hampshire Public Service Company.

5. In 1931 I placed a value jointly for the Commonwealth of Massachusetts and the Dwight Manufacturing Company on the difference in value of the water rights owned by the latter at Chicopee, Massachusetts, before and after the diversion of water from two of the tributaries of the Chicopee [15449] River by the Commonwealth.

6. In 1932 I placed a value on the developed water power of the Industrial Buildings Corporation on the Chicopee River at Chicopee, Massachusetts (successor to the Dwight Manufacturing Company) for the purpose of sale to the Quinnetuk Company, a public utility.

7. In 1920 I assisted the American Woolen Company in arriving at a selling price for its partially developed water power on the Oswego River at Fulton, New York, which that company sold to the Oswego Pulp and Paper Company.

8. About 1922 I made a valuation for the City of Providence, Rhode Island, and assisted in the purchase of seven water power plants and privileges owned by the Scituate Light and Power Company and the Joslin Manufacturing Company in connection with the development of the Scituate Reservoir on the Pawtuxet River for water supply purposes by the City of Providence.

9. From about 1928 to 1941 I made valuations of diversion damages to water power properties located on the Ware, Swift, Chicopee and Connecticut rivers for the

Metropolitan District Water Supply Commission, in connection with the development of additional water supply for the Boston Metropolitan District. These valuations included ten properties on the Ware River, one property with four water power sites on the Swift River, twelve properties on the [15450] Chicopee River, and one property on the Connecticut River.

All but seven of these cases were settled by agreement with my assistance, and seven came to trial before the Massachusetts Superior Court. In five of these cases I testified regarding the value in dispute and in the other two cases I acted as an advisor to the assistant attorney-general of the Commonwealth.

10. In 1932 I made a valuation of 37 water power properties, 26 of which are located in New York, one in New Hampshire, and ten in Maine, and assisted the purchaser, the International Hydro-Electric Corporation, in the acquisition of these properties. Twenty-six of these properties were partially developed and eleven undeveloped.

11. From 1936 to 1942, advised the TVA on value of riparian lands and water rights on the Hiwassee River in North Carolina and Tennessee.

12. In 1936 I was a member of a Board of Engineers engaged by TVA to place a value on the Wilson Dam and appurtenant properties at Mussel Shoals, Alabama.

13. In 1941 I assisted the American Woolen Company in arriving at a selling price for its water power rights on the Winooski River near Burlington, Vermont, which the company sold to the Green Mountain Power Corporation.

14. In 1942 and again in 1945 I was engaged by Mr. Ben Lyons of Chicago to place a value on the dam site on [15451] the Grand River, Oklahoma, which was utilized by the Grand River Dam Authority in connection with its hydroelectric development.

15. In 1945 I assisted the Village of Morrisville, Vermont, in the purchase of water rights on the Green River in Vermont.

Q. Have you made a determination of the fair market value as of March 1, 1905, of the lands and water rights required to carry out the Holtwood hydroelectric development of the McCall Ferry Power Company? A. Yes, I have.

Q. Had any construction work been done on the Holtwood power site on March 1, 1905? A. No.

Q. When was the McCall Ferry Power Company organized? A. The McCall Ferry Power Company was organized in April, 1905.

Q. What was the situation with respect to financing the development of the Holtwood power site on March 1, 1905? A. One Cary T. Hutchinson and Associates had acquired the land and water rights necessary for a hydroelectric development by 1905 and in February of that year he interested Bertron, Storrs & Griscom, bankers of New York, in the financing of his project. These bankers thereupon formed a syndicate to underwrite the finances required.

[15452] Q. When did actual construction of the Holtwood power development begin? A. Actual construction began October 24, 1905.

Q. How large a power development was contemplated? A. A prospectus describing the proposed development at Holtwood was issued under date of March 1, 1905. Amongst other things it stated that:

"It is proposed to make a first development for 50,000 horsepower at this site; 75,000 and possibly 100,000 horsepower can be developed economically."

Q. Was there a market for the power which was to be developed at Holtwood? A. A growing market for power existed in such large centers as Baltimore and Philadelphia and negotiations for sale of large blocks of power to Baltimore interests were initiated as early as 1902.

Q. Were the power potentialities of the Susquehanna River generally recognized by March 1, 1905? A. Long before 1905 it was recognized that there were large power potentialities throughout the lower reaches of the Susquehanna River, all apparently feasible of development, though not, equally feasible. At least five power sites had been selected and studied by different persons or companies.

Q. How was the Holtwood power site made possible? [15453] A. In the case of the Holtwood power site, as in many others, a feasible power site was created by the consolidation in one ownership of what were originally individual parcels separately owned, and on none of these parcels was there a complete feasible individual power site.

Q. What procedure is followed in the valuation of water power rights? A. Water power rights are appurtenances to and are of the nature of real estate and a similar method of procedure is adopted in the valuation of water power rights as in the case of other real estate. The principal difference between the valuation of ordinary real estate and the valuation of water rights arises from the fact that the latter involves certain engineering factors which are not involved in the valuation of ordinary real estate.

Q. How is fair market value of property defined? A. Fair market value is defined as the price which would be accepted by the owner if he was willing but not compelled to sell, and which would be offered by the purchaser if he was willing but not compelled to take the property, and both were intelligent and fully informed as to the property itself.

Q. What was the fair market value of the lands and water rights required for the Holtwood hydroelectric development as of March 1, 1905? [15454] A. In my opinion the fair market value was \$3,300,000.

Q. What are some of the engineering factors involved in arriving at your conclusion as to the value of the Holtwood lands and water rights as of March 1, 1905? A. In arriving at my conclusion concerning the fair market value